

## Age of Walking and Mental Retardation

RUTH KAHAN KAMINER, MD, AND ELEONORA JEDRYSEK, MPH

**Abstract:** The age of independent walking was noted for 200 retarded children aged 30–60 months living in the community. The onset of walking tended to be later in more severely retarded children, but early walkers were found even among the most retarded. The majority of children with mild, moderate, and severe retardation walked by 17 months. Only in the group which was profoundly retarded did the majority begin to walk after 17 months. Onset of walking before 17 months is usual in retarded children and is compatible with all levels of mental retardation. (*Am J Public Health* 1983; 73:1094–1096.)

Parents and pediatricians alike become concerned if a child is late in walking independently. Conversely, some may feel reassured about the adequacy of development if walking is accomplished at the expected time. Seventeen months is a commonly used cut-off age after which walking is considered delayed.<sup>1,2</sup>

The purpose of this paper is to describe the age of walking in a group of young retarded children living in the community. Previous studies of retarded populations report that a majority of the children began walking after 17 months.<sup>1–3</sup> Criteria for selection of these study populations, and methods of diagnosing retardation varied. Nevertheless, there is no report in the literature on the onset of ambulation in a large sample of young retarded children being raised at home whose degree of retardation was diagnosed by complete psychological testing. Our results in studying such a population differ from those cited in the literature.

### Methods

The study was conducted in a university-based multidisciplinary developmental evaluation center. Records were reviewed for 100 consecutive cases found to be mildly retarded and 100 cases diagnosed as moderately, severely, or profoundly retarded during 1979 and 1980. Characteristics are shown in Table 1. All the children were evaluated by one of the authors (EJ) using the Griffiths Mental Development Scales<sup>4</sup> and the Vineland Social Maturity Scale.<sup>5</sup> Developmental histories were obtained from the parent, a method previously shown to be reliable for ascertaining the onset of walking.<sup>6</sup> Every child had a complete physical and neurological examination and other workup as needed. Children with cerebral palsy or other specific motor handicap were excluded.

Address reprint requests to Dr. Ruth K. Kaminer, Director, Infant and Preschool Unit, Children's Evaluation and Rehabilitation Center, Rose F. Kennedy Center, 1410 Pelham Parkway South, Bronx, NY 10461. Dr. Kaminer is also Assistant Professor, Department of Pediatrics, Albert Einstein College of Medicine; Ms. Jedrysek is Principal Associate in Pediatrics at the College, and Senior Psychologist at the Center. This paper, submitted to the *Journal* July 19, 1982, was revised and accepted for publication November 29, 1982.

Our results of intelligence testing are reported as standard deviations from the mean, as used by the American Association on Mental Deficiency.<sup>7</sup> The Griffiths Mental Development Scales are scored in terms of a General Quotient (GQ) and one standard deviation (SD) is equal to 13 points. Two standard deviations below the mean (GQ 74–62) is equivalent to mild mental retardation,  $-3$  SD (GQ 61–49) to moderate,  $-4$  SD (GQ 48–36) to severe, and  $-5$  SD (GQ below 35) to profound mental retardation.

### Results

The age of independent walking increased with a decrease in intellectual functioning (Figure 1). Even profound retardation is compatible with early ambulation, however. At  $-2$  SD (mild retardation) 78 per cent of the children walked by 17 months; only at  $-5$  SD (profound retardation) were the majority of children late walkers.

In addition to intelligence, the presence of medical findings (and/or stigmata) and autistic behavior were related to the age of walking. Autistic behavior was defined as impaired social development in relating to people, events and objects, disturbance or lack of language, and the presence of repetitive mannerisms; it was seen in 30 per cent of the moderate-profoundly retarded and in 9 per cent of the mildly retarded groups. All the mildly retarded autistic children walked on time. Less than one-third of autistic, but one-half of the remaining children in the lower ranges of retardation were late walkers (Table 2).

Medical findings were divided into four categories: conditions which are the cause of mental retardation (Table 3); significant associated medical findings (Table 3); stigmatized appearance only; and no medical findings. Based on facial appearance, without quantitative measurements, 8 per cent of the children who had no medical diagnosis were considered to have a stigmatized appearance by an experienced examiner.

**TABLE 1—Population Characteristics of 200 Noninstitutionalized Mentally Retarded Children, Aged 30 to 60 Months**

Population Characteristics	N	%
Source of Referral		
Medical	120	60
Educational/Social Agency	40	20
Parent	40	20
Ethnicity*		
Hispanic	84	42
Black	78	39
White and Other	38	19
Sex*		
Male	140	70
Female	60	30
Level of Retardation		
Mild	100	50
Moderate	46	23
Severe	30	15
Profound	24	12

\*Ethnicity and sex distribution was the same for the mildly retarded group as for the group with moderate to profound retardation.

**TABLE 2—Age of Walking in Relation to Autistic Behavior for Moderately to Profoundly Retarded Children**

	Early Walkers	Late Walkers	Total
MR with Autism	21	9	30
MR no Autism	34	36	70
TOTAL	55	45	100

$$\chi^2 p = < .05$$

**TABLE 3—Medical Diagnoses and Findings in 200 Retarded Children**

	Mildly Retarded	Moderately-Profoundly Retarded
Medical Diagnoses Etiologic for MR	N	N
Down's Syndrome	0	7
Other Chromosome Defects	0	2*
Neurofibromatosis	0	2
Hunter's Syndrome	0	1
Uncontrolled Seizures—Ideopathic	0	4
Fetal Alcohol Syndrome	2	1
Intrauterine Growth Retardation	0	2
Syndromes	3**	5***
Microcephaly—Familial & MR	1	1
—3 SD	0	1
Depressed Skull Fracture	1	0
Lead Poisoning	3	0
TOTAL	10	26
Associated Medical Findings		
Non-progressive Macrocephaly	10	5
Microcephaly, -2 SD to -3 SD	2	4
Seizures, Controlled	4	4
Non-CNS Congenital Anomalies	3	4
Non-diagnostic Motor Abnormalities	1	3
Severe Sensory Handicap	0	2****
TOTAL	20	22

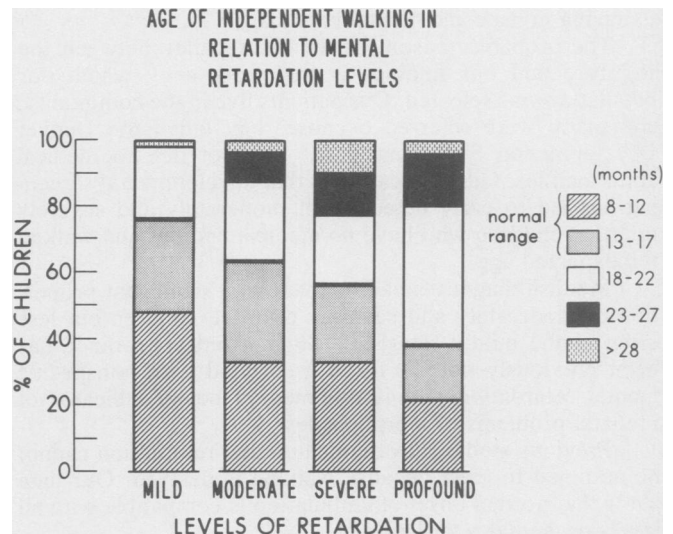
\*Trisomy 18; trisomy 22.

\*\*2 Williams; 1 Langer Giedion.

\*\*\*Williams, Prader-Willi, cerebral gigantism, poikilodermatosis, Pierre-Robin & hypotonia.

\*\*\*\*Sensorineural hearing loss; high myopia.

In the study population without any medical findings, the frequency of late walking was low and not affected by the degree of retardation (Table 4). When any medical findings were present the incidence of late walking was higher and it increased significantly with more severe retardation. Children who had only a stigmatized appearance without medical findings had the highest proportion of late walkers at all

**FIGURE 1—Age of Independent Walking in Relation to Levels of Mental Retardation**

levels of retardation. Due to the small numbers and lack of quantitative measurements this interesting finding requires further corroboration.

### Discussion

We did not find the previously reported high frequency of delayed walking among our group of retarded children. In a review of children referred to him for consultation, Illingworth<sup>1</sup> found that of those with IQs below 50, excluding Down's Syndrome, 85 per cent walked after 17 months, while with IQs between 50 and 70, 76 per cent walked after 17 months. Donoghue, *et al.*,<sup>3</sup> studied a severely retarded institutionalized population and found the mean age of walking to be 3.2 years among children with Down's Syndrome, and 4.2 years among those described as having unspecified mental retardation. Neligan and Prudham<sup>2</sup> reported that in the Newcastle Survey population 7 per cent of the children walked after 17 months of age. Among the late walkers, 9 per cent received a score below 70 or no score at all on the Goodenough Draw-a-Man Test, while the comparable figure for the early walkers was 4 per cent. Those children with "gross handicap resulting in exclusion from normal school" at age 5 years were all noted to walk late if they had Down's Syndrome, as was true of 20/25 described

**TABLE 4—Medical Findings Related to Walking**

	Mildly Retarded		Moderately-Profoundly Retarded	
	Total	Late Walkers	Total	Late Walkers
1. Medical diagnosis—etiology of MR	10	3	26	16
2. Associated medical findings	20	4	22	13
3. Stigmatized appearance only	9	5	7	5
4. No medical findings	61	10	45	12
TOTAL	100	22	100	46

as having nonspecific mental handicap.

The probable reason for the discrepancy between the literature and our findings is the process by which our population was selected. Our patients live in the community, and many were referred because they failed the Denver Developmental Screening Test,<sup>8</sup> and not due to medical abnormalities. Our impression is that developmental screening has led to early detection of moderately and severely retarded children who have no medical findings and walk at the expected age.

Medical diagnoses can be made in a significant proportion of moderately and severely retarded children but less often in the mildly retarded.<sup>9</sup> Stigmatized appearance has been previously noted<sup>10</sup> to be associated with nonspecific mental retardation and is assumed to be an indicator of prenatal problems of morphogenesis.

Previous studies have indicated that retardation cannot be assumed to exist because walking is delayed. Our data show that normal onset of ambulation is compatible with all levels of mental retardation.

## REFERENCES

1. Illingworth RS: Delayed motor development. *Pediatr Clin N Am* 1968; 15:569-580.
2. Neligan G, Prudham D: Potential value of four early developmental milestones in screening children for increased risk of later retardation. *Dev Med Child Neurol* 1969; 11:423-431.
3. Donoghue EC, Kirman BH, Bullmore GHL, Laban D, Abbas KA: Some factors affecting age of walking in mentally retarded population. *Dev Med Child Neurol* 1970; 12:781-792.
4. Griffiths R: *The Abilities of Young Children. A Comprehensive System of Mental Measurement for the First Eight Years of Life.* London: Child Development Research Centre, 1970.
5. Doll EA: *The Vineland Social Maturity Scale.* Circle Pines: American Guidance Service, 1965.
6. Donoghue EC, Shakespeare RA: The reliability of paediatric case-history milestones. *Dev Med Child Neurol* 1967; 9:64-69.
7. Grossman HJ (ed): *Manual on Terminology and Classification in Mental Retardation.* Washington, DC: American Association on Mental Deficiency, 1977.
8. Frankenburg W, Dodds JB: Denver developmental screening test. *J Pediatr* 1967; 71:181-191.
9. Kirman BH: Clinical aspects. In: Wortis J (ed): *Mental Retardation.* New York: Grune and Stratton, 1970.
10. Smith DW, Bostian KE: Congenital anomalies associated with idiopathic mental retardation. *J Pediatr* 1964; 65:189-196.

## Patient Education: Effective Management in the '80s

The American Hospital Association and the American Society for Healthcare and Training will cosponsor a national patient educational conference entitled "Patient Education: Effective Management in the '80s" to be held September 14-16, 1983 in St. Louis, MO. This national conference will be the first to address the range of management issues affecting patient education coordinators and their programs.

The conference will feature general sessions focusing on major trends in health care affecting patient education, the management challenges of patient education in the next decade, and the future use of television and computers as teaching strategies. Three workshop series will provide in-depth information on:

- Successful financing strategies
- Efficient use of resources
- Design of target population programs
- Program evaluation
- Active involvement of staff and physicians

Program fees are \$225 for AHA members (\$395 for two-person team); \$280 for nonmembers. Program fees include luncheon, breaks, and program materials.

For additional program information, contact Barbara Giloth, American Hospital Association, Center for Health Promotion, 840 North Lake Shore Drive, Chicago, IL 60611, telephone 312/280-6046. To register for this program, call AHA Division of Education 312/280-6083.

## Nursing Practice Conference Planned for November

The American Nurse's Association (ANA) announces "New Knowledge for Nursing Practice" as the theme of an upcoming conference to be held November 3-6, 1983 at the Denver Marriott City Center, Denver, Colorado.

The conference will feature 35 program sessions focusing on practice-based research findings and new discoveries in generic and specialty nursing practice.

For further information, contact Marketing, American Nurses' Association, 2420 Pershing Road, Kansas City, Missouri 64108. Telephone toll-free 800/821-5834.